Astronomy Letters 2002 vol.28 N11, pages 745-754

# X-ray emission from accretion disks in active galactic nuclei

Suleimanov V., Ghosh K., Austin R., Ramsey B.
*Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia*

## Abstract

We constructed a grid of relativistic models for standard high-relative-luminosity accretion α-disks around supermassive Kerr black holes (BHs) and computed X-ray spectra for their hot, effectively optically thin inner parts by taking into account general-relativity effects. They are known to be heated to high (~106-109 K) temperatures and to cool down through the Comptonization of intrinsic thermal radiation. Their spectra are power laws with an exponential cutoff at high energies; i.e., they have the same shape as those observed in active galactic nuclei (AGNs). Fitting the observed X-ray spectra of AGNs with computed spectra allowed us to estimate the fundamental parameters of BHs (their mass and Kerr parameter) and accretion disks (luminosity and inclination to the line of sight) in 28 AGNs. We show that the Kerr parameter for BHs in AGNs is close to unity and that the disk inclination correlates with the Seyfert type of AGN, in accordance with the unification model of activity. The estimated BH masses Mx are compared with the masses Mrev determined by the reverberation mapping technique. For AGNs with luminosities close to the Eddington limit, these masses agree and the model under consideration may be valid for them. For low-relative-luminosity AGNs, the differences in masses increase with decreasing relative luminosity and their X-ray emission cannot be explained by this model. © 2002 MAIK "Nauka/Interperiodica".

http://dx.doi.org/10.1134/1.1518712

## Keywords

Active galactic nuclei, Disk accretion, Quasars, Radio galaxies, X-ray emission